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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,820	08/05/2004	Hung Ming Chien	12419-US-PA	4819

31561 7590 06/28/2006

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER	
CHOE, YONG J	

ART UNIT	PAPER NUMBER
2185	

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/710,820	CHIEN, HUNG MING	
	Examiner	Art Unit	
	Yong Choe	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. **Claims 1~6** are presented for examination. This office action is in response to the application filed on 08/05/2004.

Drawings

2. **Figures 1~3** are objected to because of the following informalities:

Figures 1~3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Appropriate correction is required.

Specification

3. The disclosure is objected to because of the following informalities:

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Bracket ([ ]) should be removed from the title.

Appropriate correction is required.

Claim Objections

4. **Claims 1~6** are objected to because of the following informalities:

Claims 1 and 4 recite "the RAID comprises M number of storage devices, and each of the storage devices comprises N number of storage blocks". However, M and N are not defined. It does not make any sense if M and N are decimal number. The examiner suggests that M should be defined as two or more positive integer number because the RAID technique uses two or more storage devices, and N should be defined as a positive integer.

Claims 1 recites "X is a positive integer of 0 ~ M". It is unclear that X is a positive integer of 0 ~ M because 0 (zero) is not a positive integer. In mathematics, a positive integer is (1, 2, 3, 4, ...) and a non-negative integer is (0, 1, 2, 3, 4, ...).

Claims 2~3 and 5~6 are dependent on objected base **claim 1 and 4** respectively, and therefore inherit the deficiency thereof.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 1~3** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 1, the following two relationships are unclear.

a) if $D_{I,J} = P_{I,J}$, then $D_{I-1,J+1} = P_{I-1,J+1}$ wherein I = 1 ~ M and J = 1 ~ N

For example, if I = 1, then $D_{I-1,J+1} = D_{0,J+1}$. However a storage device represented as $D_{0,J+1}$ does not exist. Figure 4 shows a data block, $D_{1,1}$ as a start data block, not $D_{0,1}$ as recited in the claim.

b) if $D_{X,Y} = P_{X,Y}$, then $D_{X-1,Y+1} = P_{X-1,Y+1}$ wherein X = 0 ~ M and Y = 1 ~ N

For example, if X = 0, then $D_{X-1,Y+1} = D_{0,J+1}$. However a storage device represented as $D_{-1,Y+1}$ does not exist. Figure 5 shows a data block, $D_{0,1}$ as a start data block, not $D_{-1,1}$ as recited in the claim.

Claims 2 and 3 are dependent on objected base **claim 1** and therefore inherit the deficiency thereof.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 1 ~ 6** are rejected under 35 U.S.C. 102(b) as being anticipated by **Anderson (US Patent No. US 6,442,649)**.

As to claim 4, Anderson discloses a method of expanding an redundant array of independent disks (RAID), wherein the RAID comprises M number of storage devices,

and each of the storage devices comprises N number of storage blocks (Fig. 1 and lines 46~56 in col 1), which are defined as:

$D_{I,J}$: the J th data block (0~11 in Fig. 1) of the I th storage device (D0~D3 in Fig. 1) (Fig. 1 and lines 46~56 in col 1);

$P_{I,J}$: the J th data block (0~11 in Fig. 1) of the I th storage device (D0~D3 in Fig. 1), being a parity data block ($P_{0\sim2}$, $P_{3\sim5}$, $P_{6\sim8}$ and $P_{9\sim11}$ in Fig. 1) (Fig. 1 and lines 46~56 in col 1);

wherein, I is a positive integer of 1 ~ M, J is a positive integer of 1 ~ N, and a same J th data block in the storage devices comprises at least a parity data block (Fig. 1 and lines 35~39 in col 1), the method comprising:

providing an expansive storage device (D2 in Fig. 8, lines 66~67 in col 8 and lines 1~9 in col 9);

disposing the expansive storage device (D2 in Fig. 8) in front of the storage devices (D3 and D4 in Fig. 8), the Y th data block ($D2_{0,Y}$ in Fig. 8) of the expansive storage device (D2 in Fig. 8) is represented as $D_{0,Y}$ (Fig. 8, lines 66~67 in col 8 and lines 1~9 in col 9. Anderson teaches the expansive storage device is added in front of the last two storage devices and the Y th data block of the expansive storage device can be represented as $D2_{0,Y}$); and

sequentially moving the $D_{I,J}$ data blocks except P th, wherein Y is a positive integer of 1 ~ N, and the positions of the parity data block of the same J th data block in the storage devices are the same (Fig. 8, lines 66~67 in col 8, lines 1~9 in col 9, and

lines 34~40 in col 5. Anderson teaches the parity blocks remain at their original locations on the original storage device).

While this is unlike applicant's disclosed device, the claim is broad enough to read as Anderson's device (Fig. 8).

As to claim 1, Anderson discloses a method of expanding an redundant array of independent disks (RAID), wherein the RAID comprises M number of storage devices, and each of the storage devices comprises N number of storage blocks (Fig. 1 and lines 46~56 in col 1), which are defined as:

$D_{I,J}$: the J th data block (0~11 in Fig. 1) of the I th storage device (D0~D3 in Fig. 1) (Fig. 1 and lines 46~56 in col 1);

$P_{I,J}$: the J th data block (0~11 in Fig. 1) of the I th storage device (D0~D3 in Fig. 1), being a parity data block ($P_{0\sim2}$, $P_{3\sim5}$, $P_{6\sim8}$ and $P_{9\sim11}$ in Fig. 1) (Fig. 1 and lines 46~56 in col 1);

wherein, I is a positive integer of 1 ~ M,J is a positive integer of 1 ~ N, and the arrangement order of the storage devices is: if $D_{I,J} = P_{I,J}$, then $D_{I-1,J+1} = P_{I-1,J+1}$ (Fig. 1 and lines 35~39 in col 1), the method comprising:

providing an expansive storage device (D2 in Fig. 8, lines 66~67 in col 8 and lines 1~9 in col 9);

disposing the expansive storage device (D2 in Fig. 8) in front of the storage devices (D3 and D4 in Fig. 8), wherein the Y th data block ($D2_{0,Y}$ in Fig. 8) of the expansive storage device (D2 in Fig. 8) is represented as $D_{0,Y}$ (Fig. 8, lines 66~67 in col 8 and lines 1~9 in col 9, where teaches the expansive storage device is added in front

of the last two storage devices and the Y $_{th}$ data block of the expansive storage device can be represented as D2 $_{0,Y}$); and

sequentially moving the D $_{I,J}$ data blocks except P $_{th}$, wherein Y is a positive integer of 1 ~ N, and if D $_{X,Y}$ = P $_{X,Y}$, then D $_{X-1,Y+1}$ = P $_{X-1,Y+1}$, and wherein X is a positive integer of 0 ~ M (Fig. 8, lines 66~67 in col 8, lines 1~9 in col 9, and lines 34~40 in col 5. Anderson teaches the parity blocks remain at their original locations on the original storage device).

While this is unlike applicant's disclosed device, the claim is broad enough to read as Anderson's device (Fig. 8).

As to claims 2 and 5, Anderson further teaches the limitation wherein the step of sequentially moving D $_{I,J}$ further comprises sequentially moving D $_{I,J}$ in an ascending order based on the sequence of an I value (Fig. 8 shows a data block, 5 (D1, B) in Fig. 1 moves to (D0,B) in Fig. 8 that is moving the data block, 5 in an ascending order based on the sequence of an I value).

As to claims 3 and 6, Anderson further teaches the limitation wherein the step of sequentially moving D $_{I,J}$ further comprises sequentially moving D $_{I,J}$ in an ascending order based on the sequence of a J value (Fig. 8 shows a data block, 3 (D3, B) in Fig. 1 moves to (D3,A) in Fig. 8 that is moving the data block, 3 in an ascending order based on the sequence of a J value).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

McKean et al. (US Patent No. US 6,862,668) discloses the step of sequentially moving $D_{I,J}$ in an ascending order based on the sequence of an I & J value.

Sako et al. (US Patent No. US 4,964,128) discloses a data transmission method in which data blocks to be transmitted.

Inquiry

10. Any inquiry concerning this communication should be directed to **Yong Choe** at telephone number **571-270-1053**. The examiner can normally be reached on M-F 8:30am to 5:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Chanh Nguyen** can be reached on **571-272-7772**. Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 whose telephone number is (571) 272-2100.

Signature: _____

Yong J. Choe
Examiner / Art Unit 2193

CHANH NGUYEN
PRIMARY EXAMINER